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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|-----------------------|------------------|
| 10/797,335 | 03/10/2004 | Hideki Iwata | 60377-0019 (W1339-01) | 4427 |

7590 02/01/2007
RADER, FISHMAN & GRAUER . P.L.L.C
1233 20TH STREET N.W.,
SUITE 501
WASHINGTON, DC 20036-5339

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| EXAMINER |
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LANG, AMY T

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| ART UNIT | PAPER NUMBER |
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3731

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 02/01/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/797,335

Applicant(s)

IWATA ET AL.

Examiner

Amy T. Lang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 13 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,7-9 and 11-16 is/are pending in the application:
- 4a) Of the above claim(s) 2, 4, 6, and 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,7-9 and 11-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.

Response to Arguments

1. The rejection to the specification in office action mailed 09/22/2006 has been withdrawn in light of applicant's amendments mailed 11/13/2006.

The 35 USC 103 rejection to Iwata in office action mailed 09/22/2006 has been withdrawn in light of applicant's reply mailed 11/13/2006.

2. The terminal disclaimer filed on 11/13/2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 6,983,681 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Applicant's arguments filed 11/13/2006 have been fully considered but they are not persuasive.

3. Specifically, applicant argues (A) that the cited references do not disclose a sliding member composed of components specified in claim 1 of the instant application.

With respect to argument (A), claim 1 of Iwata discloses a sliding member. Furthermore, as discussed in office action mailed 09/22/2006, claims 1, 3, 5, 6, 8, 11, 13, and 15-17 of Iwata disclose the specifications recited in the instant claim 1.

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Hermann discloses a composition for imparting anti-friction properties to a sliding element, which overlaps a sliding member (column 1, lines 12-18). The specifications of the composition are discussed below and overlap the claimed sliding layer. Therefore, a sliding member is disclosed comprising a sliding layer.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hermann (US 3,839,209) in view of United Lab Equipment, Inc and Wikipedia.

Hermann discloses a composition that provides anti-friction properties to a sliding element, which therefore overlaps the instantly claimed sliding member (column 1, lines 12-17). The composition comprises an epoxy resin, mixtures of bismuth powder and metal (lead) powder, and a solid lubricant (column 1, lines 12-14; column 3, lines 9-11;

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claim 1, column 11). The metal powder is further disclosed as an alloy comprising copper, which therefore overlaps a copper based alloy (claim 7, column 11). The solid lubricant is further disclosed as graphite, molybdenum disulfide, and lead sulfide (claim 8, column 11).

Hermann does not disclose the amounts of each component in vol%.

The mixture of bismuth powder and metal powder, as disclosed by Hermann, is present in the composition from about 5 to 60 wt% (claim 1, column 11). Since density is a standard characteristic, the examiner utilizes a density of 11.34 g/cm^3 for the lead powder and 9.78 g/cm^3 for the bismuth powder (Wikipedia). Furthermore, the remainder of the composition is comprised of an epoxy resin in an amount from 40 to 95 wt% (claim 1, column 11). The density of an epoxy resin is estimated at 1.96 g/cm^3 for the calculation (United Lab Equipment, Inc). Thus, the examiner computed the total volume of each extreme range of bismuth or metal powder and the epoxy resin by using the formula $(\text{wt})=(\text{vol})(\text{density})$. The vol% of bismuth and lead was then found by dividing the range of bismuth or metal with the total volume. The vol% of the lead is found to be between 0.91 and 20.58 vol% and the bismuth between 1.06% and 23.10%. Therefore, although Hermann does not specifically disclose the instantly claimed ranges, Hermann does disclose a mixture of the two in ranges that overlap the instantly claimed so that it would have been obvious to utilize each component within the instantly claimed amounts.

The amount of solid lubricant lead sulfide is utilized in one example in an amount of 7 wt% (Example 4, column). The other components and their density include Resin A

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(1.96 g/cm³), Resin B (1.96 g/cm³), powdered lead (11.34 g/cm³), Sil Aid (2.336 g/cm³, which is the density of silicon), and aluminum phosphate (2.566 g/cm³) (Wikipedia and United Lab Equipment, Inc). As explained above, the volume of each component was calculated using the formula $(wt)=(vol)(density)$ and then the total volume was added. The vol% of lead sulfide was calculated as the vol of lead divided by the total volume, which was found equal to 2.3 vol%. Therefore, the amount of solid lubricant lead sulfide clearly overlaps the instant range of 1 to 30 vol%. Since Hermann discloses that either lead sulfide, graphite, or molybdenum disulfide can be used in the invention as the solid lubricant, it would have been obvious to replace lead sulfide with graphite or molybdenum disulfide and utilize them in the same amount.

Since Hermann discloses the metal powder, bismuth powder, and solid lubricant within the instantly claimed ranges, the sum of these three components would not exceed 70 vol%.

7. Claims 9 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hermann (US 3,839,209) in view of United Lab Equipment, Inc, Wikipedia, and Shimotomai (US 5,868,555).

The combination of Hermann, United Lab Equipment, Inc and Wikipedia, as discussed in paragraph 6 and incorporated here by reference, disclose a composition that provides anti-friction properties to a sliding element. However, this combination fails to disclose the sliding member as used for a swash plate of a swash plate type piston pump.

Shimotomai discloses, as shown in Figure 5, a swash plate type piston pump (11b) (Column 4, line 66 through column 5, line 2). The swash plate comprises a sliding member (78) (column 5, lines 13-14).

Harmann discloses the disclosed composition as providing advantageous anti-friction properties to a sliding member and Shimotomai discloses that swash plates comprise sliding members. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention for the composition of Hermann to be utilized in a sliding member of a swash plate type piston pump for reduced friction properties.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy T. Lang whose telephone number is 571-272-9057. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anhtuan Nguyen can be reached on 571-272-4963. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

01/23/2007

ATZ


ANH TUAN T. NGUYEN
SUPERVISORY PATENT EXAMINER
1/21/07